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Journal of the Society of Arts.

FRIDAY, JUNE 15, 1855.

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GENERAL MEETING.

Wednesday, June 13, 1855.

The General Meeting to receive the Report of the Council relative to the proceedings of the past year, and the Auditors' statement of Accounts, was held on Wednesday, the 13th inst., Viscount Ebrington, M.P., Chairman of Council, in the chair.

The following candidates were balloted for and duly elected ordinary members:—

Homersham, John
Howes, Frederick William
Leighton, George Cargill
Mc Kay, Hugh
O'Beirne, James Lyster

REPORT FROM THE COUNCIL TO THE SOCIETY, ON THE CLOSE OF THE ONE HUNDRED AND FIRST SESSION.

The Council in laying before the members the Annual Report of their proceedings, would first refer to the Educational Exhibition, which, although commenced in the previous year, and due to the labours of the former Council, has actually taken place since the presentation of the last Report. It is unnecessary here to enter into all the details connected with its establishment and its objects; the members are familiar with them, from the chairman's address at the commencement of the Session, and from the reports in the Journal of the lectures and other proceedings connected with it. The Council, however, would be wanting in their duty were they to pass over without observation that remarkable series of lectures which were delivered at St. Martin's Hall in connection with the Exhibition—a series remarkable not only for the number and varied character of the subjects embraced, but also for the attainments of the individuals by whom they were delivered. During the nine weeks that the Exhibition was open, there were no less than sixty-one lectures given. A list of these will be found in the Appendix to this Report

To these gentlemen the thanks of the Society are eminently due. It is to be regretted that no permanent and complete record of these lectures remains, but many were delivered without even written notes. Abstracts of nearly all were, however, published in the Journal; some few were published separately by their authors, and at the request of the Council, the MSS. of others were furnished to Messrs. Routledge, who undertook their publication in a cheap form, and the volume* of the Exhibition Lectures thus published forms an interesting and valuable contribution to our Educational literature.

Reports on the different departments of the Exhibition were intended to have been made, but difficulties of a nature unnecessary here to specify, prevented this portion of the plan being fully carried out, and only two were obtained, viz , one on the Fine Art Department, for which the Society are indebted to Sir C. L. Eastlake, P.R.A., and Mr. F. S. Cary, and the other on the Musical Instrument Department, to the Rev. W. W. Cazalet. These were published in the Journal. In the Journal, too, will be found an original and interesting Paper "On the School System of Norway," contributed by Councillor Nissen; also an account of "The New York Free Academy," furnished by the Board of Education of that City, and Reports on the Exhibition from M. Milne Edwards, specially deputed by the Minister of Instruction in France to visit it, and by Dr. P. A. Siljeström, Commissioner for Sweden. The articles in the Journal, by "A Member," reviewing the books exhibited, must have been read with interest, displaying as they did an intimate and practical acquaintance with the subject. They may be taken as a careful, intelligent, and impartial report on that section of the Exhibition. It was early seen how desirable it was that such a collection should be permanent, and the Council lost no time in communicating with her Majesty's Government, urging the importance of forming a National Collection of this nature, and pointing out the facilities which the present opportunity afforded for commencing the work. The Council are happy to state that the Government has announced its determination to establish such a collection as a National Museum of Education, and the Council are anxiously looking for the accomplishment of this most desirable object. The Council have equal pleasure in announcing, that on the faith of such a Permanent Museum being established, a large number of the contributors to the display in St. Martin's Hall have most liberally responded to the request made by the Council, and have placed their contributions at the disposal of the Society as free gifts for the Permanent Museum. The Exhibition excited considerable interest, not only in this country, but among foreign nations. Very large and valuable contributions were received from abroad, and the Exhibition was visited by Commissioners from several Foreign governments and Educational bodies, specially charged with the duty of reporting upon its contents. Although in a pecuniary point of view the Exhibition did not pay its expenses, having, notwithstanding the liberal subscriptions received, involved the Society in a deficit of nearly £400; yet the Council are satisfied that it has not been held in vain, and that it has exerted a powerful and important influence upon, and given a permanent impulse to, the progress of an improved education.

The Council have great satisfaction in referring to the succession of valuable and varied papers which have been read and discussed at the evening meetings of the Society during the present Session.

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* Lectures, in connection with the Educational Exhibition of the Society of Arts, Manufactures, and Commerce. London: G. Routledge and Co. Price 1s. 6d.

During the present Session there have been 24 ordinary meetings, 1 special meeting, and 2 extraordinary meetings for the purpose of resuming discussions which it was found impossible to terminate on the evenings on which they were commenced.

The first ordinary meeting was devoted to the reception of an Address[*] from the Chairman of Council, Viscount Ebrington, M P., on the Opening of the One Hundred and First Session. In this his Lordship gave a review of the past and present position of the Society, and pointed out those matters which the Council proposed should be undertaken during the ensuing session.

This was followed by a paper by Professor Crace Calvert, "On Various Products obtained from Coal (coal-gas excepted)."[†] After alluding to the formation of coal, and to the actual and theoretical duty obtained by the use of different kinds for raising steam, he proceeded to speak of some improvements in the manufacture of coke. The products which chemists had ascertained to exist in the substances distilled from coal, were divided into three classes—gases, liquids, and solids. Into the first he did not enter. The second contained an aqueous portion and a tarry portion, the former of which was chiefly valuable for its ammonia, and was useful to chemical manufacturers, in dye-works and the like, and to agriculturists; and the latter produced light and heavy oils, which had been applied, amongst other things, for the preservation of wood. A paper of a similar kind was that by Mr. W. Longmaid, "On Peat and other Vegetable Charcoal, and some of its Uses."[‡] Attention having been forcibly directed, on many occasions, to the bog lands of the United Kingdom, as offering an inexhaustible supply of organic matter ready to be converted into fuel suited for many manufacturing and domestic purposes, Mr. Longmaid conceived that a simpler and more economical method of converting it into charcoal might be introduced. His process consists in steeping vegetable matter in dilute sulphuric acid, and drying it at a low temperature, whereby he obtains from 40lbs. to 65lbs. of charcoal from every 100lbs. of dry material submitted to the operation.

Mr. P. L Simmonds, whose intimate acquaintance with our Colonies, and especially with their resources, peculiarly fitted him for the task, gave some very valuable information to merchants and manufacturers in his paper "On Unappreciated and Unused Articles of Raw Produce from different parts of the World."[§] A mere enumeration of the various items touched upon by Mr. Simmonds, will serve to show how extensive was the field of research into which he entered, and it is to be hoped that his labours will result in adding to our list of imports many new materials of commerce, and increasing our supplies of old staples. The many important purposes served by vegetable fibre, the comparative, if not the complete dependence of the manufacturers of this country on foreign supplies, and the large sums of money annually expended in obtaining them, have naturally led to the inquiry—more particularly at the present epoch, when our trade with one nation is stopped—whether in our own possessions, there could not be found materials suitable for the preparation of cloth and cordage, and of paper. To this point, then, attention was first called, and it was shown that in the East and West Indies, and in the islands of the Indian Archipelago, plants yielding serviceable fibres were found in abundance, whilst of the available fibres of the vast valley of the Amazon, of the thistles of the Pampas of South America, of the prairie grasses and reeds of North America, and of the indigenous products of Central Africa, we know literally nothing. This shows the desirableness for all travellers being somewhat acquainted with the pressing needs of Commerce. Gums and resins were next treated of, and then the products of the forests of the globe came under review; and the variety of ornamental woods suitable for the manufacture of furniture, and at present almost unused, was shown to be inexhaustible. Fruits and vinous and fermented drinks, medicinal plants, the products of the sea, the tenants of the air, and the insect tribe, were then successively noticed, especial attention being called to the question of the preservation of food, so that its superabundance in parts where population is sparse, might be made to supply the requirements of thickly-peopled countries. A subsidiary paper, "On the Influence of Climate on Production,"[*] by Mr. A. G. Findlay, suggested one view of the same subject not always kept prominent, viz., that the nature of the raw products is dependent on the physical and climatological conditions of their locality.

Mr. Mechi's "Fourth Paper on British Agriculture,"[†] raised two very important questions, which have been much debated—the application of steam to cultivation, and the comparative merits of liquid and solid manure. In regard to the first, it seemed to be considered by those who took part in the discussion which followed the reading of the paper—including Colonel Challoner, Mr. J. B. Lawes, Mr. Wren Hoskyns, Mr. J. Caird, Mr. Morton, Mr. Sidney, Mr. Davis, &c.,—that at present the weight and bulk of the engine, appeared to be incompatible with the simultaneous cultivation and progression over the yielding surface of the field; whilst as to the latter, it was pointed out that though the sewage of towns existed principally in a liquid form, the manure of the farm was mostly solid, and it was thought that there was scarcely sufficient experimental evidence to prove the economy of converting farm yard manure to the liquid form. Two other points were also discussed, the economy of labour, and the profitableness of feeding stock. Mr. J. B. Lawes in his paper "On the Sewage of London,"[*] first proceeded to point out what constitutes value in a manure, and next directed attention to the composition of sewage. Considering that human excrements were the main items to be taken into calculation, he estimated the amounts of carbon and nitrogen consumed per day in the food of individuals of different classes, ages and sexes; registered the amounts of carbon expired daily by the lungs; and then quoted or calculated from various experimenters the amounts of solid and liquid excrements and the valuable constituents contained therein. Mr. Lawes calculated that the sewage of London, if entirely freed from water, would amount to 51,286¾ tons, of which about one-sixth was nitrogen, namely, 8,859¾ tons, equal to 10,758¼ tons of ammonia. This is, however, unfortunately distributed through such a vast bulk of water, that the cost of its distribution would be enormous, whilst it was questionable how far it would be beneficial for corn crops. Various attempts have been made to solidify the sewage, but Mr. Lawes thinks that with our present knowledge the manufacture of a solid sewage manure is quite impracticable. He therefore recommended that a few thousand acres at no great distance from the Thames should be devoted to grass, as the most suitable crop for the application of liquid sewage, and this would return to the metropolis milk and cream, with which the inhabitants are at present most inadequately supplied. The discussion on this subject extended over two evenings, and was well sustained by the several speakers who had taken part in the discussion on Mr. Mechi's paper, (which may be said to have been the means of obtaining for the Society the valuable investigations of Mr. Lawes,) as well as by Mr. Chadwick, Mr. F. O. Ward, Professor Way, Mr. T. Scott, Messrs. Bazalgette and Haywood, (Engineers to the Metropolitan and City Commissions of Sewers,) Mr. Paine, of Farnham, &c. There was universal agreement as to the desirableness of freeing the metropolis and the river Thames of the sewage, but great diversity of opinion was exhibited as to whether the cost of the collecting and distributing works would be realised; whether, in fact, the value of the article would repay the expenses incurred in pumping, &c.

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[*] *Vide* ante, page 1. [†] *Vide* ante, page 17. [‡] *Vide* ante, page 151. [§] *Vide* ante, page 33.

[*] *Vide* ante, page 42. [†] *Vide* ante, page 49.

Another branch of sanitary engineering, that of Water Supply, was treated of by Mr. S. C. Homersham, in his paper on "The Chalk Strata Considered as a Source for the Supply of Water to the Metropolis."[*] In many districts of Great Britain, where the soil rests on impermeable strata, the water that falls flows off by means of rivers, canals, brooks, and streams, and is collected in reservoirs and used for supplying towns. On the other hand, where the soil rests upon chalk, as on the Chiltern Hills and the North Downs, the water sinks into the earth and goes to supply subterranean reservoirs, flowing from thence, through the interstices in the planes of stratification, into the sea. The proposal of Mr. Homersham is, that before the water reaches the sea, it should be intercepted for the supply of the metropolis. The only drawback to the use of this water is, that it contains about 17½ grains of bi-carbonate of lime per gallon, but this, by the softening process of Dr. T. Clark, of Aberdeen, which he described, may be precipitated. In the discussion, objection was taken by Mr. F. Braithwaite, the Rev. J. C. Clutterbuck, and Mr. Evans, as to the quantity of the water to be derived from this source, and Mr. Braithwaite took exceptions to its quality, on the ground that the water of the deep wells under London was becoming salter and salter every year, showing that there must be an infiltration of salt or brackish waterinto the so-called London basin. To this it has since been replied that though the presence of salts in the water in question cannot be denied, yet that they are becoming less and less in quantity year by year, and that their presence at all is to be accounted for not by any supposed infiltration of sea-water, but rather to the fact that the chalk being a marine formation, contains within itself a large per centage of salts, which are gradually being washed out, and that this would explain how it comes to pass that they are less in quantity in water obtained from wells in the higher districts of the chalk, than in that derived from the low-lying beds.

In the same class may be mentioned the paper by Mr. G. W. Muir, "On the Smoke Nuisance considered Morally, Historically, Scientifically, and Practically."[†] This gentleman does not at all doubt but that the nuisance of smoke may be got rid of, but he argued that before the government took legal proceedings against offenders, they should be prepared to show how it might be done. For his own part, he believed that it involved a question of dimensions and not inventions. Also, that by Dr. D. B. Reid, "Notes on the Revision of Architecture in connection with the Useful Arts, with Special illustrations of the Ventilation of St. George's Hall, Liverpool,"[‡] in which he advocated that the architect should make acoustics, warming, lighting, ventilation, and drainage, his special study, and that in designing buildings all these things should be taken into account. In regard to this paper, it should be mentioned that it was produced at a few days' notice, owing to some doubt having been expressed as to whether that originally intended for the evening in question could be ready in time.

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[*] *Vide* ante, page 263.

[*] *Vide* ante, page 168. [†] *Vide* ante, page 134. [‡] *Vide* ante, page 379.

Remembering the vast mineral wealth of this country, it is not surprising that so many evenings should have been devoted to the consideration of papers treating of our metallic industries. These papers were partly manufacturing, and partly commercial and statistical. That by Mr. Harry Scrivenor, whose treatise on the Iron Trade has been so generally appreciated, and is so well known, "On the Growth and Expansion of our Foreign and Colonial Trade in Iron, and the Fiscal Obstructions to its Extension,"* showed that in all countries the requirement of iron was progressive, and that the railroad was the great step in advance. In his opinion, the extension of our trade depends principally upon the cost of production, and not upon the duty,—and, holding this view, he expressed the belief that a reasonable rate of wages would be found more advantageous to the men and their families than the high rates sometimes contended for, and that a moderate cost of iron was likely to be of more permanent benefit to the ironmasters. In the discussion on this paper, Mr. W. Bird combatted several of the views which had been expressed, remarking that the advancement of a country depended upon its ability to obtain a plentiful supply of *cheap* iron, and this it could not do so long as any fiscal restriction remained. Prussia, he said, had been destroyed as a consuming country, because, in the hope of making it a producing one, the prices had been unduly advanced by high duties. He then followed a pig of iron from the Elbe to Austria, showing the number of places at which it was stopped to pay toll, and concluded by arguing that such proceedings could not but prove serious obstacles to the extension of trade in these directions. In Professor John Wilson's paper "On the Iron Industry of the United States,"† it was shown that, notwithstanding the enormous mineral resources of that country, the make of iron was not equal to the consumption, owing, as he believes, to that industry being as yet in its infancy, and to the want of capital The deficiency is supplied from Great Britain, our exports of iron to that country alone exceeding by about one-third the gross exports to other countries. To retain this good customer "economy of production" was most essential, and this depended not alone upon cheap labour, but upon the ironmasters seeking for and adopting improved processes. The difference in price between the two countries is 80 per cent., of which 50 per cent. is a natural protection due to freight, commission, insurance, &c., and 30 per cent. is an artificial protection, being the present *ad valorem* import duty. Professor Wilson concluded by calling attention to the manufacture of wrought-iron *direct* from the ore—an aspiration in all iron producing countries for years back, and by which the blast and refinery furnaces were hoped to be dispensed with. The paper by Dr. W. H. Smith, of Philadelphia, on "The Utilization of the Molten Mineral Products of Smelting Furnaces,"* described a process in which the slag is worked out of the furnace into a chamber, or else by covered conduits into a waggon or car, or large ladle. Here it is refined by subsidization, and from thence it is run into moulds. When the slag is "set," the articles are transferred to an annealing furnace close at hand, which is kept at a bright red heat until fully charged, and then it is brought up to a higher degree of heat for a few hours, when all the apertures are hermetically closed, and the whole is allowed to cool, occupying some four or five days. The articles on removal are found, it is said, to be strong, compact, devitrified masses, varied in colour, and capable of being polished. The importance of rendering this material commercially useful, may be judged from the fact that there are at present from six to eight millions of tons produced yearly in this country, and this is not only useless, but is attended with enormous expense for removal and "tipping." "The Mineral Industries of Great Britain"† were reviewed by Mr. Robert Hunt, F.R.S., Keeper of Mining Records. In this paper he traced the progressive development and future prospects of our respective mineral industries, treating of each metal in its historic order, and concluded by calling attention to the want, up to the present time, of anything like a system of education specially directed to these great industries, to which may be attributed in some degree the loss of nearly 1000 men annually in coal mining. Mr. Charles Sanderson, of Sheffield, in his paper "On the Manufacture of Steel, as carried on in this and other Countries,"‡ gave the results of 30 years' experience in almost all parts of the world where steel is produced, in regard to a manufacture about which little is known and less has been written. He described the processes of production of natural or raw steel, from crude iron as obtained from the blast furnaces, of cemented or converted steel, by the carbonization of wrought iron, and of cast steel, by the fusion of either natural or converted steel, but principally the latter. In contrasting the steel manufacture of England with that of America and the

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* *Vide* ante, page 65. † *Vide* ante, page 247.

* *Vide* ante, page 335. † *Vide* ante, page 363. ‡ *Vide* ante, page 450.

Continent of Europe, he estimated the weight made in each country, and therefrom its value as an article of commerce. Following the pathological investigations set in motion by the Society, Mr. Herbert Mackworth, Government Inspector of Mines, read a paper "On the Diseases of Miners,"* in which he advocated improved ventilation, the removal from the mine of all putrescent matter, the provision of an accident room, and the establishment of a Benefit Society, at the joint expense and under the joint management of the proprietors and the workmen.

If in papers on our mineral industries this Session has been rich, the same cannot be said of our textile manufactures. The paper by Mr. Thomas Dickins, of Middleton, on "The Commercial Consideration of the Silk-worm, and some of its Products,"† was the only one of its class. In this the question was considered whether it was possible to reel silk in this country, and it was argued that the French reelers had partially solved the problem, for they had imported immense quantities of cocoons from Greece and Syria, and reeled them in their own filatures, so that our manufacturers have been using many thousands of pounds of so-called French silk, but which, in reality, came from Greece or Syria. He then proceeded to describe an invention of Mr. John Chadwick's, of Manchester, for simplifying the usual processes of silk reeling, by which, in one operation, the silk is reeled direct from the cocoon on a bobbin, and "thrown" at the same time.

Mr. Alfred Smee, F.R.S., in his paper "On the New Bank of England Note, and the Substitution of Surface Printing from Electrotypes for Copper-plate Printing,"‡ stated that the object of the alteration was to effect a saving of expense in the production of Bank notes, and to give them increased identity of appearance. The original design having been fixed upon, recourse was had for the duplication to the processes of Electro-Metallurgy. For the purpose of obtaining moulds where the original is of wood, gutta percha is generally employed—the surface being black-leaded. Moulds of the Britannia, which is engraved on steel—are, however, made by striking it upon pure soft lead. When perfection is desired, electro-moulds alone are depended on. Mr. Smee also referred to the manufacture of the paper for the Bank notes, at Mr. Portal's mill, in Hampshire, and stated that in the new note considerable improvements had been effected in the water-marking. Heretofore the device or water-mark which was required had been produced by an infinite number of wires stitched and sewn together—now it is engraved in a steel-faced die, which is afterwards hardened, and is then used as a punch, to stamp the pattern out of plates of sheet brass. This invention is due to Messrs. Smith and Brewer. A subsidiary paper by Mr. W. Stones, "Observations on the Means Available for Securing Bank Notes, Cheques, and Similar Documents against Counterfeit and Alteration,"* urged that in commercial documents of importance, cheques, drafts, &c., greater precautions should be taken against forgery than was now the case. He then reviewed the means at our disposal for the purpose, which were: 1st. Peculiarities in the pulp or manufacture of the paper. 2. Chemical preparations, introduced at the time of manufacture or subsequently. 3. Water-marks or devices for distinguishing any given paper from all others. 4. The style and subject of the engravings; and 5. The inks used in printing.

Herr Joseph Kumpa, of Dresden, in his paper "On a New Method of Teaching Drawing, involving the Principle of a Natural System of Architecture,"† argued that in teaching drawing, the first thing to teach a pupil was how to draw a straight line. After this was done he might be told to copy a square, and then to divide it into quarters, diagonals, and various other mathematical figures. From straight lines he would proceed to arcs and curves, and eventually into some practice in the use and combination of the elementary colours. The discussion on this paper was well sustained by Mr. R. Redgrave, R.A., Mr. G. Wallis, Mr. Digby Wyatt, Mr. John W. Papworth, Mr. F. S. Cary, Mr. H. Twining, Mr. H. Mogford, Mr. Burchett, Mr. J. D. Harding, Professor Donaldson, and others, when it appeared that the system recommended was by no means new, but that it had been considered so good in England, that it was the plan followed in all the Government Schools of Art, and had been practised in them for some time.

The Special Meeting was held on Friday, the 2nd of February, to receive a short paper from Mr. Leone Levi, "Observations on the Congress proposed to be held at Paris, for the Improvement of International Commercial Law,"‡ as introductory to a discussion on that subject. Mr. Levi advocates an International Code, by which the rights of traders as partners, as debtors, and as creditors,—as shipowners,—as insurers,—as shareholders in national enterprises, as well as the rights of authors and artists should be alike, and governed by the same forms of procedure in all. In the discussion, in which Mr. John Howell, Mr. Headlam, M.P., Mr. Collier, M.P., Dr. Waddilove, Mr. Lyne, Mr. H. T. Hope, Mr. Chadwick, C.B., Colonel Sykes, F.R.S., Mr. W. Hawes, Viscount Ebrington, M.P., and others took part, it was recommended by some of the speakers, that before asking other nations to a Congress to bring about any such assimilation, it was desirable that the government of this country should review the charters and the laws in force in our own colonies, in which nearly every European code might be met with, and some even that were obsolete, and that then, when assimilation had been attained between the mother country and her dependencies, we should be better prepared to meet the jurists of other nations.

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* *Vide* ante, page 347. † *Vide* ante, page 197. ‡ *Vide* ante, page 81.

* *Vide* ante, page 89. † *Vide* ante, page 287. ‡ *Vide* ante, page 187.

The desirableness of decimalising our coins and accounts, now almost universally admitted, again formed the subject of discussion, three papers being read on the same evening. That by Mr. J. A. Franklin, "On the Expediency of at once Decimalising English Moneys and Weights,"[*] advocated the pound as a unit; that by Mr. Hugo Reid, "On Decimal Coinage,"[†] recommended that the florin, or two-shilling piece, should be taken as the unit—which is practically the pound system—as it resolves itself merely into the question where the decimal point shall be placed; whilst the third, by Mr. F. J. Minasi, "On the Basis of a Decimal System of Money for the United Kingdom,"[‡] urged that the penny should be taken as the basis. The choice of a unit seems now to lie between the pound and the penny. The general feeling would appear to be in favour of the former, though there are undoubtedly some difficulties to be met, as several of the daily affairs of life are governed by the penny, as for instance postage and receipt stamps, bridge and road tolls, parliamentary railway fares, &c.

Colonel Arthur Cotton, late Chief Engineer, Madras, who has for the last 20 or 30 years steadily contended for the extension of public works in India, in his paper "On Public Works for India, especially with Reference to Irrigation and Communications,"[§] pointed out that at the present moment there were scarcely 50 miles of imperfectly made road in any district of 10,000 square miles. The valley of the Ganges, the Agra Presidency, the Punjaub and Mysore, formed rare exceptions. Also, that at the rate at which railways are now being made, it would take 130 years to provide India to the same extent as England was furnished at the present moment with similar communications; and even then several hundred thousand miles of common roads, or light railways, or canals, would be required. Colonel Cotton is a staunch advocate of the canal system, by which works of irrigation and communication might go hand-in-hand, and which he believed might be executed and maintained at far less cost than the railway. With the latter it is necessary to provide a large and costly rolling stock, involving a heavy outlay in the first instance, and serious disbursements to maintain; whereas in the case of canals there would be a number of small, local proprietors, by whom the traffic would be carried on, they finding the boats and crews, and paying toll to the Canal Company. It was also a question whether heavy goods traffic could be so profitably transported by railways as by canals. The discussion on this subject was extended over two evenings, Mr. Gregson, M.P., Mr. Ayrton, Mr. Cornelius Nicholson, Col. Sykes, F.R.S., Mr. Dickinson, Mr. F. Carnac Brown, Mr. S. Sidney, Mr. R. Lowe, M.P., Mr. W. Bridges Adams, Mr. Hyde Clarke, Col. Sir Frederick Abbott, C.B., Mr. Andrew Henderson, Mr. R. W. Crawford, Mr. R. F. Davis, Mr. Chadwick, C.B., Mr. John Bourne, Colonel Cotton, and others, taking part in it. The discussion, unfortunately, was carried on as if it were a question between canals and railways, whereas the real point at issue is, whether or not a regular system of public works ought not to have been, or at least should not now be, provided for that vast empire. The East India Company have been blamed for negligence in this respect, but it should be remembered, that had it not been for the success of their political and military rule, there would have been no need of such works, and that up to this time all the energy and resources of the empire have been thrown into these departments of the State, rather than into the development of her vast resources, the creation of great industries, the extension of commerce, and the social improvement of her population, now it is to be hoped, speedily to be accomplished.

Mr. Jelinger Symons, B.A., one of H. M. Inspectors of Schools, called attention, in his paper "On Juvenile Crime as it affects Commerce, and the best means of repressing it,"[*] to the fact that gaols, so far from effecting the reformation of juvenile delinquents, harden the offender, if they do not confirm him in crime. In Mr. Symons's opinion punishment and reformation ought to go together; but others think that the latter element is the only appliance that is necessary. He considered also that the treatment of juvenile offenders belongs properly to the state. The conclusions at which Mr. Symons had arrived were warmly combatted by Mr. Power, (Recorder of Ipswich), and the following gentlemen among others also took part in the discussion, Dr. Waddilove, Mr. J. H. Elliott, Mr. Slaney, Captain O'Brien, Mr. W. A. Shields, Lord Lyttelton, and Mr. Muntz, M.P.

"The Capability for Mercantile Transport Service of Steam Ships,"[†] by Mr. Charles Atherton, Chief Engineer of H.M. Dockyard, Woolwich, was considered in reference to the mutual relations of their tonnage, displacement, engine-power, steaming-speed, distance to be run without re-coaling, tons weight of cargo, and the expenses incurred per ton weight of cargo conveyed. Although during the last year the government contracts for the transport service amounted to three millions sterling, these were entirely based on the indefinite terms "tonnage" and "horse-power." No legislative enactment has hitherto defined the standard unit of quantity that is meant by the tonnage of a ship, as denoting the measure of a ship's capability for transport service, or what is meant by "nominal horse-power," as the standard unit of the measure of the amount of force which a marine engine may be legally required to be capable of exerting. Some examples were given of war-steamers, all having the same "nominal" horse-power, but in which the "effective" or real horse-power actually stood in proportion to the numbers 1, 2, 3, and 4. The Right Hon. the Earl of Hardwicke, the Astronomer Royal, F.R.S, Captain J. M. Laws, R.N., Mr. J. Scott Russell, F.R.S., Mr. Andrew Murray, Mr. Chatfield, and Mr. Henderson, entered into the discussion of the paper; and it was elicited that previous to the introduction of steam into the Royal Navy, the fittings of every vessel of the same class were uniform in size and alike in kind, so that the spare stores of one were available for the supply of any other that might require them. Now, as was expressed by Captain Laws, though line-of-battle ships might be fitted with the same power, "both engines and boilers were as unlike in pattern as a knife was to a fork."

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[*] *Vide* ante, page 211. [†] *Vide* ante, page 222. [‡] *Vide* ante, page 219. [§] *Vide* ante, page 395.

[*] *Vide* ante, page 415. [†] *Vide* ante, page 466.

On the occasion of the opening of the Collection of Specimens of Animal Produce and Manufactures, forming the first division of a general Trade Museum, Professor Edward Solly, F.R.S., read a paper "On the Mutual Relations of Trade and Manufactures,"* in which he pointed out their mutual dependence the one upon the other, and showed the evils that had arisen in all times from unfair monopolies and restrictions. He then referred to the Museum itself, described what it should be, and expressed the belief that to be useful to merchants and others likely to desire the information it would be calculated to give, it should be situated in London.

The last paper of the session was by Mr. Colin Mather, "On Earth-boring Machinery."† After alluding to the various processes and mechanism in use in England for this object, the paper went on to describe a machine of new construction, the chief novelties in which consisted in the form of the boring head and the shell pump, and the mode of acquiring the percussive motion. The latter is accomplished by means of a steam cylinder, the steam being admitted at the bottom only. A cast-iron rod in connection with the piston raises the pulley over which the guide-rope is passed, and so lifts the boring-head. When the piston has reached the top of the stroke, a projection in the same rod is made to act on a cam, by which the steam is shut off, and the exhaust port is opened. The boring-head and piston then fall by their own weight. Very favourable results were said to have been attained by the use of this machine, but it is right to add that Mr. Herbert Mackworth stated in the discussion, that still higher results had been attained in Germany, by the use of an apparatus invented by Herr Kind.

A paper by Mr. A. Henderson, on "The Past and Present Position of Life-boats,"* was to have been read on the 18th of April, but the time at the disposal of the meeting did not allow of this being done. It has, however, been recently published in the Journal.

The Council think it needless to express to the members any opinion upon the value and importance of the papers which have been read, and of the discussions which have taken place during the session, and of which the foregoing is a very imperfect *resumé*.

The Council feel that the meetings of the present session have been appreciated by the members, and it is, therefore, unnecessary, and would be a useless task on their part, to endeavour to impress upon the members that which is already acknowledged. They have great satisfaction in announcing that to the authors of five of the papers read during the present year, the Society's Silver Medal has been awarded. These gentlemen are—Mr. Charles Atherton, Col. Arthur Cotton, Mr. J. B. Lawes, Mr. Charles Sanderson, and Mr. P. L. Simmonds. They have also determined that Dr. Forbes Royle's paper "On Indian Fibres fit for Textile Fabrics, or for Rope and Paper Making,"† read during the last session, should be similarly acknowledged.

The Committee on Industrial Pathology has continued its labours, and its first Report, "On Trades which affect the Eyes," has already been printed in the Journal. The Committee have this year undertaken to report on the injuries arising out of Dusty Trades, and are endeavouring to obtain such information on this division of their subject, as will render their report of practical value to those engaged in and suffering from such occupations.

The Council, viewing the great benefit to Arts and Manufactures likely to arise from the artizans of this country visiting the Paris Exhibition, at the close of the last session called the attention of the members of the Society and of the Institutions in Union to the subject, and suggested the formation of Local Clubs for raising, in weekly or monthly subscriptions, a fund to enable the workman to meet the expenses of such a visit. A Committee of correspondence was appointed in connection with this subject, to collect and publish in the *Journal* such information as might facilitate these excursions by the working men. An establishment for the reception and accommodation of the artizans has been started in Paris, mainly, it is believed, in consequence of attention having been called to the subject by the exertions and correspondence of the Committee. Her Majesty's Government, too, has accorded the privilege of passports free of all charge to artizans purposing to visit Paris this summer. The details of these arrangements have already been given in the *Journal*, and the Council have the satisfaction of stating that the correspondence with the Institutions shows that clubs have been formed, and that many of the members of the Institutions contemplate a visit to the Exposition Universelle.

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* *Vide* ante, page 487. † *Vide* ante, page 503.

* *Vide* ante, page 510.

† Vide *Journal of the Society of Arts*, Vol. II., page 336.

The Committee for investigating the manner in which the improvements in the city of Paris are effected, and how far the proceedings adopted in France in reference to such matters are or are not superior to those of this country, has collected a considerable amount of valuable and instructive information, which will be embodied in the report of that Committee. For a large portion of this information the committee are indebted to the kindness and liberality of the Prefect of the Seine, who at their request at once placed at the disposal of the Committee all the information which the records of his office could supply. The report of this Committee will appear in the Journal during the recess.

The subject of a Parcels Post was adverted to in the opening address of the Chairman of Council as one to which the Society would apply itself during the session. Accordingly a Committee has been appointed, who have very carefully considered the importance and practicability of establishing such a system, and the report of the Committee is now in course of preparation, and will appear in the Journal during the recess.

The great value of an improved system of International Commercial Law was brought to the notice of the Council by a number of the members of the Society specially and practically conversant with the anomalies at present existing, and the impediments such anomalies present to the free course of commercial transactions. On a requisition by these members the Council convened a special meeting of the Society to discuss the question, which was introduced to the meeting in the paper by Mr. Leone Levi, previously referred to. The Committee are now in correspondence with M. Achille Fould, Ministre d'Etat, urging on him the importance of taking advantage of the numerous distinguished persons who will visit Paris during this summer to hold a Congress there for the discussion of this subject.

It is not inappropriate here to allude to the subject of Limited Liability in Partnership—one in which the Society has taken so warm an interest. The members will have seen with pleasure that Parliament has under its consideration bills brought in by the Ministers of the Crown for amending the law in this respect.

The arrangement between the Royal Commissioners of the Great Exhibition of 1851 and the Council in relation to the formation of a collection of raw and manufactured animal produce, as the first step towards the establishment of a General "Trade Museum," expires in July next. The Council congratulate the members on the valueable collection which has been got together, and which is now exhibited in the Model Room of the Society, open to the inspection of the members and their friends. The collection is entirely due to the skill, zeal, and judgment of Professor Solly, to whom its formation was entrusted. Professor Solly has had many difficulties to contend with, arising from the novelty of the undertaking, the fears and jealousies of some, and the indifference of others; but his energy has overcome them, and the Society has reason to be proud of what has been accomplished. The task, however, of the Council is not fulfilled until means have been attained for placing this collection where it may be completed on a permanent basis, and rendered readily available for the commercial public. For this end the Council have worked, and will continue to work, during their remaining short term of office, earnestly hoping that their successors will pursue the same course of policy, and not relax their endeavours until this important end shall be attained.

The premium list issued by the Council at the commencement of the session was carefully revised, and subsequently a list of special prizes was published, for two of which the Society are indebted to the liberality of Benjamin Oliveira, Esq., M.P., who placed at the disposal of the Council two prizes of £25 each, or a gold medal of equal value, for such subjects as the Council should determine. These were offered—

> "For two pounds of the best and finest Flax Thread, spun by machinery suitable for lace-making."

And the other—

> "For the best Essay on the Means of Preventing the Nuisance of Smoke arising from fires and furnaces."

The awards for these two prizes are still under consideration.

Another of the special prizes—viz., £5, to which the Society added its medal—

> "For a Composition for the feeding rollers used in printing paper-hangings by cylinder machinery, similar in consistency and action to those used in letter-press printing, but adapted for working in water-colours,"

is due to Mr. S. M. Hubert.

The important position which the Microscope now holds, not only in relation to pure but to applied science, and its great value in assisting to form those habits of observation which it is the object of all sound education to impart, induced the Council to believe that the promoting the production of a good instrument at a price which should render it more readily accessible to the many, was an object worthy of the Society; and, accordingly, under the advice and with the assistance of a Committee, composed of Mr. Busk, F.R.S.; Dr. Carpenter, F.R.S.; Mr. Jackson; Dr. Lankester, F.R.S.; Mr. Quekett; and Mr. W. W. Saunders, F.R.S., the following prizes were offered:—

For a "School" Microscope, to be sold to the public at a price not exceeding 10s. 6d.—*The Society's Medal.*

For a Teacher's or Student's Microscope, to be sold to the public at a price not exceeding £3 3s.—*The Society's Medal.*

The Council undertook to purchase 100 of the smaller, and 50 of the larger instruments for which the medals should be awarded.

The members will be glad to learn that for these prizes there have been numerous competitors. After most careful examination of all the instruments by the Committee, they unanimously reported to the Council that the instruments sent in by Messrs. Field and Co., of Birmingham, fulfilled all the conditions required, and the Council have, therefore, awarded to that firm the medals offered, on Messrs. Field and Co. entering into the necessary undertakings to comply with the requirements of the Prize List. The Council congratulate the members on this result. Those members who are desirous of securing any of these instruments, which will shortly be supplied to the Society by Messrs. Field, at a discount of 10 per cent., should at once send in their names to the Secretary.

In addition to the papers and objects alluded to above for which medals have been awarded, some few of the inventions which have been sent in for consideration by the Society's Committees have been deemed worthy of reward, but as the labours of the Committees are not yet completed, the Council deem it right to withhold the publication of any partial list.

The Exhibition of Inventions was held this year in April, it being considered that that time of year was preferable to December, the period at which it has hitherto been held. The number of exhibitors each year continues to increase, and notwithstanding arrangements were this year made giving a much larger space for Exhibition, it must be admitted on all hands that the Society's Model Room does not afford sufficient room for the proper display of the articles exhibited.

The Journal has now become a necessary and permanent feature in the Society's action. To Lady Bentham, His Excellency Sir. Wm. Reid, (Governor of Malta), Mr. Bridges Adams, Mr. Charley, Dr. Macgowan, Mr. Harry Scrivenor, and the Honourable R. Temple, (Chief Justice of Honduras), the thanks of the Council and of the Society are eminently due for their contributions to the pages of the Journal. It is much to be wished that in our Colonies the example of Sir. W. Reid, Mr. Temple and Dr. Macgowan were imitated, and that we could obtain information from our other Colonies and dependencies like that afforded by those gentlemen. This want has this session been to some extent supplied by the articles of Mr. P. L. Simmonds on the Colonial Contributions to the Paris Exhibition.

The Council this year has revived the series of Picture Exhibitions which was commenced by that of Mulready, followed by that of Etty The present collection contains the works of the late J. J. Chalon, R.A., with a selection from those of A. E. Chalon, R.A., Portrait-painter in water colours to her Majesty.

The great success which attended the Society's Centenary Festival at the Crystal Palace last summer, led many to express the hope that the Council would each year give the members and their friends a similar opportunity of meeting. It has, therefore, been determined that the One Hundred and First Anniversary Dinner shall be held at the Crystal Palace on Tuesday, the 3rd of July, when his Grace the Duke of Argyll, F.R.S., has kindly consented to preside. The following gentlemen have already undertaken to act as Vice-Chairmen:—Viscount Ebrington, M.P., Chairman of Council, Professor Owen, F.R.S., as representing Science, F. Crossley, Esq., M.P., as representing Manufactures, and J. M. Rendel, Esq., F.R.S., as representing Mechanics and Engineering.

The Union of Institutions continues to increase steadily. 36 have been this year added to the list, and the Union now includes 368 Institutions, omitting those that have declined, and that have ceased to exist.

The financial statement of the Society's income and expenditure and balance-sheet is given below, and if it appear not to be so favourable as that of last year, the members should bear in mind that the Society has not diminished in numbers, but that there have been 206 new members elected this session. It must not be forgotten that the loss on the Educational Exhibition of nearly £400, and the expenses of the Trade Museum go far to account for the result. These, however, are items which will not occur again in our annual expenditure. When these circumstances are taken into consideration, the financial position of the Society must be deemed satisfactory, and the members will feel no regret that the funds of the Society have been applied in promoting successfully objects of such national importance.

ANNUAL STATEMENT OF RECEIPTS, PAYMENTS, AND EXPENDITURE, FOR THE YEAR ENDING 31ST MAY, 1855.

Dr.

	£	s.	d.	£	s.	d.	£	s.	d.
To Subscriptions for the year ending May 31st, 1855:—									
From Members and Institutions in Union with the Society:—									
Annual received	2759	7	0						
Outstanding	934	10	0						
				3693	17	0			
Deduct on former years	153	6	0						
Estimated not recoverable	156	4	9						
				309	10	9			
				3384	6	3			
Life Contributions				205	16	0			
							3590	2	3
To Dividends on Stock:—									
£3166 13s. 4d. Consols				89	9	0			
1969 10s. 6d. ditto, held in special trust				55	13	0			
388 1s. 4d., 3¼ per Cent.				12	1	2			
To Interest on Life Subscriptions				3	3	8			
							160	6	10
To Special Objects:—									
By Balance of Subscriptions at Commercial Bank on account of Educational Exhibition				14	6	1			
Ditto in hands of Mr. Davenport				17	16	6			
							32	2	7
To Royal Commissioners of Exhibition of 1851, on account of Trade Museum							200	0	0
To Journal				1	6	0			
Barry's Etchings				6	6	0			
Gurwood Despatches				8	8	0			
Exhibition of Inventions				7	12	6			
Breakages				3	9	0			
							27	1	6
Subscription from T. Twining, Esq., in aid of the Working Classes Museum							70	0	0
Institute Book Orders							818	12	2
							4898	5	4
By Excess of Expenditure over Income							98	15	11
							£4997	1	3

Cr.

	£	s.	d.	£	s.	d.
By General Establishment Expenses:—						
Rents, Rates, and Taxes	153	18	8			
House and Office	147	15	6			
Salaries, Wages, and Commissions	799	10	7			
Postage Stamps and Parcels	146	12	6			
Stationery and Printing	182	4	11			
				1430	12	2
By Special Objects:—						
Medals and Rewards	1	0	0			
Strikes and Lockouts	12	4	11			
Trade Museum	505	13	9			
Working Classes' Museum	75	13	0			
				594	11	8
By Journal	879	14	9			
Less charged to Union of Institutions	175	18	11			
				703	15	10
Exhibitions:—						
Exhibitions of 1854-55	92	5	5			
French Exhibition, 1855	5	0	0			
Educational Exhibition	363	9	5			
Chalon Exhibition	31	5	11			
				492	0	9
Committees:—						
Union of Institutions, including Journal, Postage, Printing, Stationery, and other charges	734	2	10			
Institute Book Orders	817	5	0			
Gurwood Despatches	8	8	0			
Pathological Committee	5	4	8			
				1565	0	6
Conversazione				48	5	8
Library, Pictures, &c.	10	2	0			
Bell's Manual	3	0	6			
				13	2	6
Repairs and Alterations	85	7	3			
One Year's Interest on Debenture of £1000	43	13	8			
				129	0	11
Dinner, 1854				20	11	3
				£4997	1	3

Balance Sheet, 31st May, 1855.

Dr.

	£	s.	d.	£	s.	d.
To sundry Creditors, viz.,						
To Tradesmen's Bills	£1236	16	7			
Salaries and Commissions	18	14	9			
Debenture at 4½ per cent	1000	0	0			
Interest on ditto	10	13	8			
				2266	5	0
To Trust Liability in respect of Government Stock (Consols) held for specific purposes, as per contra, viz.,						
Set apart to answer:—						
Swiney Prize Bequest	1333	6	8			
Acton Trust	536	3	10			
Stock Trust	100	0	0			
Fothergill Trust	388	1	4			
	£2357	11	10			
By Excess of Assets over Liabilities				1836	18	1
				£4103	3	1

Cr.

	£	s.	d.	£	s.	d.
By Cash in hand,						
At Messrs. Coutts and Co.	£117	15	7			
At Commercial Bank	265	15	7			
In hands of Secretary	14	2	1			
At Commercial Bank on account of Educational Exhibition	12	6	1			
In the hands of Mr. Davenport, Do.	17	16	6			
				£427	15	10
By Dividends due April 5th, on £388 1s. 4d., 3¼ per cent.				5	18	9
By Consols, £3166 13s. 4d., at 91				2881	3	3
By Subscriptions in arrear, £934 10s., estimated to be not recoverable to the amount of £156 4s. 9d.				788	5	3
By Government Stock held in trust, applicable to specific purposes, viz.:—						
Consols	1969	10	6			
3¼ per Cent.	388	1	4			
				£4103	3	1

W. F. Harrison, } *Auditors.*
M. Marshall, }
P. Le Neve Foster, *Secretary.*

APPENDIX.

List of Lectures Delivered in Connection with the Educational Exhibition at St. Martin's Hall.*

Rev. W. Whewell, D.D., F.R.S., Master of Trinity College, Cambridge, "On the Material Helps of Education." (II., 593, and Parker.)

Professor de Morgan, "On the Relation of Mathematics and Logic to other Branches of Knowledge." No 1 of a series. (II., 593.)

Rev. J. S. Howson, "On Teaching Geography." (II., 594.)

Dr. Arnott, F.R.S., "On Warming and Ventilating Schools." (II., 609.)

Dr. Carpenter, F.R.S., "On the Training of the Will, and the Formation of Habits." (II., 611.)

Dr. R. G. Latham, F.R.S., "On certain Points of Geographical Teaching." (II., 611.)

Mr. Arthur Henfrey, F.R.S., "On the Relation of the Science of Botany to other Branches of Knowledge." No. 3 of a series. (II., 612, and Routledge.)

Rev. F. Trench, "On good and bad Delivery in Reading." (II., 612, and Parker.)

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* The references to each lecture are to the abstracts in the Journal, and when the lecture has been printed to the publisher.

Herr Hoffman, "On Playthings and Occupations for Early Childhood." (II., 613.)

Mr. Horace Grant, "On Writing." (II., 613, and Routledge.)

Professor Rymer Jones, F.R.S., "On Modern Discoveries by the Microscope." (II., 623, and Routledge.)

Dr. A. W. Williamson, F.R.S., "On the Relation of Chemistry and Physics to other Branches of Knowledge." No. 2 of a series. (II., 624.)

Dr. Carpenter, F.R.S., "On Natural History as a Means of Education." (II., 625.)

Mr. T. Huxley, F.R.S., "On the Relations of Physiological Science to other Branches of Knowledge." No 4 of a series. (II., 625, and Van Voorst.)

Dr. Guy, F.S.S., "On the Use of Common-Place Books in Self-Education." (II., 626, and Routledge.)

Rev. Dr. Booth, F.R.S., "On the Influence of Examination as an Instrument of Education." (II., 627, and Routledge.)

Mr. Hullah, "On Music as an Element of Education." (II., 628, and Parker.)

Rev. Professor Baden Powell, V.P.R.S., "On Elementary Instruction in Mathematics." (II., 629.)

Mr. Sopwith, F.R.S., "On Models and Diagrams." (II., 635, and Routledge.)

Rev. J. P. Norris, "On School Discipline and its Effects on the Behaviour of Children." (II., 636.)

Rev. Professor Baden Powell, V.P.R.S.. "On Elementary Instruction in Astronomy by means of Models." (II., 637.)

Dr. R. G. Latham, F.R.S., "On the Studies connected with Geography, and on the Relations of that Science to other Branches of Knowledge." No. 5 of a Series. (II., 637.)

Hon. Henry Barnard (Superintendent of Common Schools in Connecticut, U.S.), "On the Public Schools of New England." (II., 638.)

Professor Creasy, "On the Relations of History, Biography, and Political Economy to other Branches of Knowledge." No. 6 of a Series. (II., 667.)

Mr. Jelinger Symons, "On Industrial Schools." (II., 641, and Routledge.)

Rev. C. Marriott (Dean of Oriel Coll. Oxford), "On the Digestion of Knowledge." (II., 642, and Routledge.)

Dr. R. G. Latham, F.R.S., "On the Phonic and Phonetic Systems of Teaching to read in the Ordinary Print." (II., 643.)

Rev. C. H. Bromby, "On the Aims and Instruments of Real Education." (II., 644.)

Dr. Scott, "On Teaching the Deaf and Dumb." (II., 651, and Routledge.)

Rev. E. Sidney, "On Teaching the Idiot." (II., 651, and Routledge.)

Professor Tennant, F.G.S., "Mineralogy and its Application to Geology and the Arts." (II., 680.)

Henry de Laspée, "On the Principles and Teaching of Gymnastics," practically illustrated. (II., 653.)

Mr. Hugo Reid, "On Mathematical Geography and easy methods of Teaching it." (II., 653, and Routledge.)

The Dean of Hereford, "On 'Common Things' and School Fees." (II., 654, and Groombridge.)

Hon. and Rev. S. Best, "On Village Reading Rooms and Libraries." (II., 656, and Groombridge.)

Rev. W. Mitchell, "On Teaching Crystallography." (II., 658.)

Mr. Knighton, "On Stow's Training System of Education adapted for large Towns." (II., 658, and Routledge.)

Mr. W. Ellis (Champion-hill, Camberwell), "On Economic Science." (II., 667, and Routledge.)

Mr. Herbert Mackworth, M. Inst., C.E., Inspector of Coal Mines, "On Science in the Mines." (II., 669, and Routledge.)

Professor Nichol, "On the Right Teaching of History, illustrating the Right General Method in Education." (II., 681.)

Rev. Sidney Turner, "Reformatory Schools."

Rev. Vincent Ryan, "On the Relation of Foreign to English History." (II., 670.)

Mr. Arthur Hill, "On Punishments and Rewards." (II., 671.)

Rev. G. E. L. Cotton, "On the Necessity of an Extended Education for the Educator." (II., 672, and Routledge.)

Professor Hunt, F.R.S., "On Familiar Methods of Instruction in Science." (II., 672, and Routledge.)

Rev. A. B. Power, "On School Organization, with Special Reference to the Use of Parallel Desks." (II., 682.)

Cardinal Wiseman, "On the Home Education of the Poor." No. 1. (II., 683, and Routledge,)

Mr. W. A. Shields, Master of the Peckham Birkbeck School, "On Object-Teaching;" illustrated.

Cardinal Wiseman, "On the Home Education of the Poor." No. 2. (II., 695, and Routledge.)

Professor Hunt, F.R.S., "On Classes for Scientific Observation in Mechanics' Institutes." (II., 684, and Routledge.)

Rev. John Curwen, "On the Tonic Sol Fa Method of Teaching Singing;" illustrated. (II., 695.)

Rev. W. W. Cazalet, "On the History of Musical Notation." (II., 711.)

Mr. John Yeats, F.R.G.S., "On Public Instruction in Holland and Switzerland." (II., 685.)

Mr. W. Bridges Adams, "On the Paths of Physical Progress." (II., 696.)

Rev. M. Mitchell, "On the Study of the Arts, Architecture, Painting, and Sculpture, with Non-Artistic Education." (II., 698.)

Mr. W. A. Shields, (Peckham Birkbeck School,) "How to Teach Economic Science in our Ordinary Schools." Illustrated by a Lesson to Fifty or Sixty Children. (II., 699.)

Mr. Harry Chester, "On Mechanics' Institutes." (II., 731.)

Mr. J. C. Morton, "On Agricultural Instruction in Parish Schools." (II., 699.)

Madame Ronge, "On Infant Training (Kindergärten.)" (II., 711.)

Mr. Hugo Reid, "How to Teach Reading." (II., 712.)

Mr. W. A. Shields, (Peckham Birkbeck School,) "On the Inspector and the Schoolmaster." (II., 725, and Routledge)

After the reading of the Report it was moved by Mr. Hyde Clarke, seconded by Mr. H. Twining, and

Resolved,—That the Report of the Council and the Financial Statement of the Auditors be received and adopted.

The Secretary stated that the General Meeting for the Election of Officers would be held on the evening of Wednesday July the 4th, when the ballot will be kept open from 7 to 9 o'Clock, in accordance with the Bye-Laws.

MEETINGS FOR THE ENSUING WEEK.

MON.	Architects, 8. Mr. G. R. Burnell, "Practical Observations on Pile Driving."
	Chemical, 8.
	Statistical, 8. Mr. W. B. Hodge, "On the Mortality from Naval Operations." Mr. Charles Babbage, "An Analysis of the Statistics of the Clearing House, during the Year 1839." Dr. Guy, "On the Nature and Extent of the Benefits conferred by Hospitals on the Working Classes and the Poor."
TUES.	Linnæan, 8.
WED.	Microscopical, 8.
THURS.	Numismatic, 7. Anniversary.
	Antiquaries, 8.
	Royal, 8½.
FRI.	Philological, 8.
SAT.	Royal Botanic, 3¾.

PATENT LAW AMENDMENT ACT, 1852.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette*, *June* 8*th*, 1855.]

Dated 22*nd May*, 1855.

1152. J. Cruickshank, Marcassie, N.B.—Cavalry equipment.
1154. H. Holland, Westfield, U.S.—Treating metalliferous sulphurets.
1156. J. Morgan, Manchester—Platted wicks for candles.

Dated 23*rd May*, 1855.

1160. F. Leeshing, Busby, near Glasgow—Preparing dyestuffs.
1162. T. McLow, 6, Middle-row, Holborn—Paddle wheels.
1164. W. Smith, 10, Salisbury-street, Adelphi—Safety apparatus for mine shafts. (A communication.)

Dated 24*th May*, 1855.

1166. W. Smith, Snow-hill, and N. F. Taylor, Gloucester-terrace, Chelsea—Gas-meters.
1168. A. F. G. Seegers, Paris—Paper-hangings.
1170. J. Park, Bury—Paper pulp.
1172. C. Rawlings, Sherborne—Writing desks.
1176. O. R. Chase, Boston, U.S.—Machine for making confectioners' "pipe," &c.
1178. T. McLow, 6, Middle-row, Holborn—Paddle wheels.
1180. G. Horrocks, Pilkington—Shuttles.

Dated 25*th May*, 1855.

1182. T. M. Greenhow, Newcastle—Iron ships.
1184. L. de Parienté, Schaerbeck, next Brussels—Sawing wood. (A communication.)
1186. E. Aldridge, Boston—Water meters, &c.
1188. J. and W. Allen, Newcastle—Alkaline salts.

Dated 26*th May*, 1855.

1190. R. W. Waithman, Bentham-house, York, and J. Waithman, Manchester—Lint.
1194. R. Maclaren, Glasgow—Prevention of smoke.
1196. J. Aspinall, Fenchurch-street—Extracting moisture from various substances.
1202. T. M. Rabatté and J. Rettig, Paris—Bruising, graining, or currying leather, skins, or hides.
1204. D. Methven, 9, Pembroke-cottages, Caledonian-road—Stoppers for bottles.
1206. F. T. Botta, Paris—Mixed furnaces.
1208. A. E. L. Bellford, 32, Essex-street, Strand—Flax machinery. (A communication.)

Dated 28*th May*, 1855.

1210. S. Rowlands, Birmingham—Purifying gas. (A communication.)
1216. F. de Moriès, Montmartre, near Paris—Obtaining motive power.
1220. T. P. Salt, Birmingham—Artificial legs.

Dated 29*th May*, 1855.

1224. J. B. Acklin, Paris—Substituting paper for pasteboard in Jacquard looms.
1226. E. J. Payne, Birmingham—Covered thread. (A communication.)
1228. W. Langshaw, Eagley, near Bolton, and G. and W. Jelley, Leicester—Fancy fabrics with both sides alike.
1230. G. Rogers, Alfred-place west, Thurloe-square—Apparatus for aerated liquors. (A communication.)
1232. J. H. Johnson, 47, Lincoln's-inn-fields—Casting metals. (A communication.)
1234. T. McLow, 6, Middle-row, Holborn—Screw-propellers.

Dated 30*th May*, 1855.

1236. A. V. Newton, 66, Chancery-lane—Calculating apparatus. (A communication.)

WEEKLY LIST OF PATENTS SEALED.

Sealed June 8*th*, 1855.

2607. William Bemrose, jun., and Henry Howe Bemrose, Derby—Improvements in the mode of, and machinery for, punching and perforating paper and other substances.
2612. George Henry Bachhoffner, Upper Montagu-street—Improvements in the construction of fireplaces for the better consumption of smoke, and in lighting and maintaining fires.
2640. William Clark, Upper-terrace, Islington—Improvements in anchors.
736. William Lund and William Edward Hipkins, Fleet-street—Improvements in the manufacture of corkscrews.

Sealed June 12*th*, 1855.

2613. Timothy White, Landport, Portsmouth—Improvements in constructing portable houses and other buildings and structures.
2621. John Louis Jullion, Combe House, Tovil, Kent—Separating certain vegetable fibres from mixed fabrics for varous useful purposes.
2635. William Charles Scott, Warner-road, Camberwell—Improvements in paddle-wheels.
2637. Louis Cornides, 4, Trafalgar-square—Improved apparatus for coating or covering surfaces of glass or other material with collodion.
2644. Francis Archer, Bishopgate-street, and William Papineau, Stratford—Improvements in distilling peaty, schistose, bituminous, and vegetable matters.
2657. Juliana Martin, Soho-square—A safety apparatus for effectually cleaning windows from the inside of a room.
2662. William Hartley, Bury—Improvements in safety valves for steam boilers and in steam engines.
2669. James Pritchard, Portsea—Improvements in the construction of screw propellers.
2674. Frederick Augustus Robert Glover, Bury-street, St. James's—Improvements in or applicable to the construction of carriages.
2691. George Bell, 21, Cannon-street-west, and George Charles Grimes, Wandsworth—Improvements in the manufacture of lucifer or congreve matches and other instantaneous lights.
2692. William Bertram, 5, Upper Harden-street, Woolwich—Improvements in the manufacture of iron ships, steam and other boilers, bridges, and other structures where numerous sheets of iron are used.
2715. George Anderson, Gas Works, Rotherhithe—Improvements in purifying sewers and buildings, or other places of noxious vapours.
2721. Charles Edward White, Fulham, and Francis Robinson, Putney—Improvements in signalling for railway purposes.
2729. John Lang Dunn, Glasgow—Improvements in working up certain waste sulphates and nitrates, and for the manufacture of useful products therefrom.
2731. John Comstock, New London, U.S.—Improvements in trip hammers.
2753. Henry Richard Fanshawe, and John Americus Fanshawe, North Woolwich—Improvements in the manufacture of various kinds of waterproof garments.
2756. Eugéne Mayeur, 62, Tredegar-square, London—A new hydraulic pump or machine, based on the centrifugal principle, for the purpose of raising, forcing, or exhausting (even muddy) waters or other fluids, and applicable to the wants of agriculture, industry generally, and to the salvage of ships. (A communication.)
2672. John Henry Johnson, 47, Lincoln's-inn-fields—Improvements in obtaining motive power. (A communication.)
5. Stephen Giles, Caledonian-road, Islington—Improved ratchet-brace.
8. Henri Louis Dormoy, Paris—Improvements in manufacturing and twisting silk, cotton, wool, and other fibrous substances.
39. John Scott, Sunderland—Improvements in the construction of anchors.
74. Robert Oxland, Plymouth—Improvements in the manufacture and revivification of animal charcoal.
110. Henry Adkins, Edgbaston, near Birmingham—Improvements in bleaching or decolorising oily and fatty bodies.
153. Matthew Boulton Rennie, 21, Whitehall-place—Improvements in preserving animal and vegetable substances for food.
179. James Webster, Birmingham—Improved method of changing the direction of and multiplying motion.
218. John Imray, 64, Bridge-road, Lambeth—Improvements in locks.
238. Jacques Roux Delguey-Malavas, Montbrison, France—Improved machinery for obtaining and applying motive power.
244. Thomas Ogden Dixon, Steeton, near Keighley—Improvements in machinery or apparatus for turning, boring, cutting, and shaping wood and similar materials.
398. William Hartcliffe, Salford, and Joseph Waterhouse, Manchester—Improvements in looms for weaving.
400. John Norton, Dublin—Improvements in the construction of cartridges for fire-arms.
781. Manning Prentice, Stowmarket, and Thomas Richardson, Newcastle-upon-Tyne—Improvements in the manufacture of manures.
713. Manning Prentice, Stowmarket, and Thomas Richardson, Newcastle upon-Tyne—Improvements in the manufacture of manures.
718. Charles Whitley, Manchester—Improvements in machinery or apparatus for drilling.
733. Robert Stirling Newall, Gateshead-on-Tyne—Improvement in the standing rigging of ships and other vessels.
739. Henry Chapman, Kingsland—Improved electro-mechanical apparatus for supplying and adjusting the electrodes used in the production of the electric light.
761. Charles Goodyear, 42, Avenue Gabriel, Champs Elysées, Paris—Improvements inself-inflating pontoons and life-preservers.
765. Herbert Mountford Holmes, Derby—Improvements in the manufacture of tyres for wheels.
766. Peter Arrive, 7, Spencer-street, Darnley-road, Gravesend—Improvements in safety valves of steam boilers.
801. Samuel Holt, Shaw-heath, Stockport—Improvements in weaving plush or pile fabrics.
803. Philippe Amédée Devy, 10, Old Jewry Chambers—Improvements in the construction of coke ovens.
813. Alexander Cuninghame, Glasgow—Improvements in the manufacture or production of sulphuric acid and sulphates of iron and alumina.
842. Robert Milligan, Harden—Improvement in the manufacture of woven fabrics made of wool, mohair, or alpaca.
844. Charles Crapelet, 4, Rue des Fossés, Montmartre—Improvements in the construction of tompions for cannon and other fire-arms, which improvements are applicable to stopping bottles and other vessels.
874. John Atherton, William Boyes, and William Lancaster, Preston—Improvements in temples employed in the manufacture of textile fabrics.